



Joint Survivability Experiment with NAVAIR

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11-14 April 2005
Monterey, CA

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U.S. ARMY TANK AUTOMOTIVE RESEARCH DEVELOPMENT AND ENGINEERING CENTER

SUPERIOR TECHNOLOGY FOR A SUPERIOR ARMY

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Collaborating Partners

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SUPERIOR TECHNOLOGY FOR A SUPERIOR ARMY

US Army Research, Development, and Engineering Command (RDECOM)
Tank-automotive Research, Development and Engineering Center (TARDEC)
Survivability, Intelligent Systems, and National Automotive Center (NAC) Ground Vehicle
Simulation Laboratory (GVSL)
Warren, MI

US Navy Naval Air Systems Command (NAVAIR)
Air Combat Environment Test and Evaluation Facility (ACETEF)
Patuxent River, MD

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Introduction and Project Scope

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SUPERIOR TECHNOLOGY FOR A SUPERIOR ARMY

- Requirements driven by TARDEC Survivability Technology Area “customer”
- Demonstrating and Evaluating new technology in areas of Survivability to aid soldier *Situational Awareness* and *Protection*
- Simulation environment (TARDEC Embedded Simulation System) to provide modeling for:
 - *Sensors*
 - *Countermeasures*
 - *Decision Aids*
 - *Weapons Systems*
 - *Armor*
 - *Vehicle Mobility*
 - *Human Performance Models (HPM)*
- NAVAIR to provide airborne assets for intelligence reporting and air support



Survivability Requirements

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- Integrated Survivability Active Protection System (IS APS)
 - Demonstrates Platform Protection System (PPS) for Future Combat Systems (FCS) Manned Ground Vehicle (MGV)
- Commanders Decision Aid
 - Software provided by BAE Systems (Nashua, NH)
- Sensor Suite
 - Laser Warning Receiver (LWR)
 - Electro-optical / Infrared Warner (EO/IRW)
- Threat Modeling
 - AT-5 threats / Semi-automatic Command to Line of Sight (SACLOS)
 - Rocket Propelled Grenades (RPG-7)
- Countermeasures
 - Electromagnetic Armor (EMA)
 - Multifunction Countermeasure (MFCM)
 - Smoke

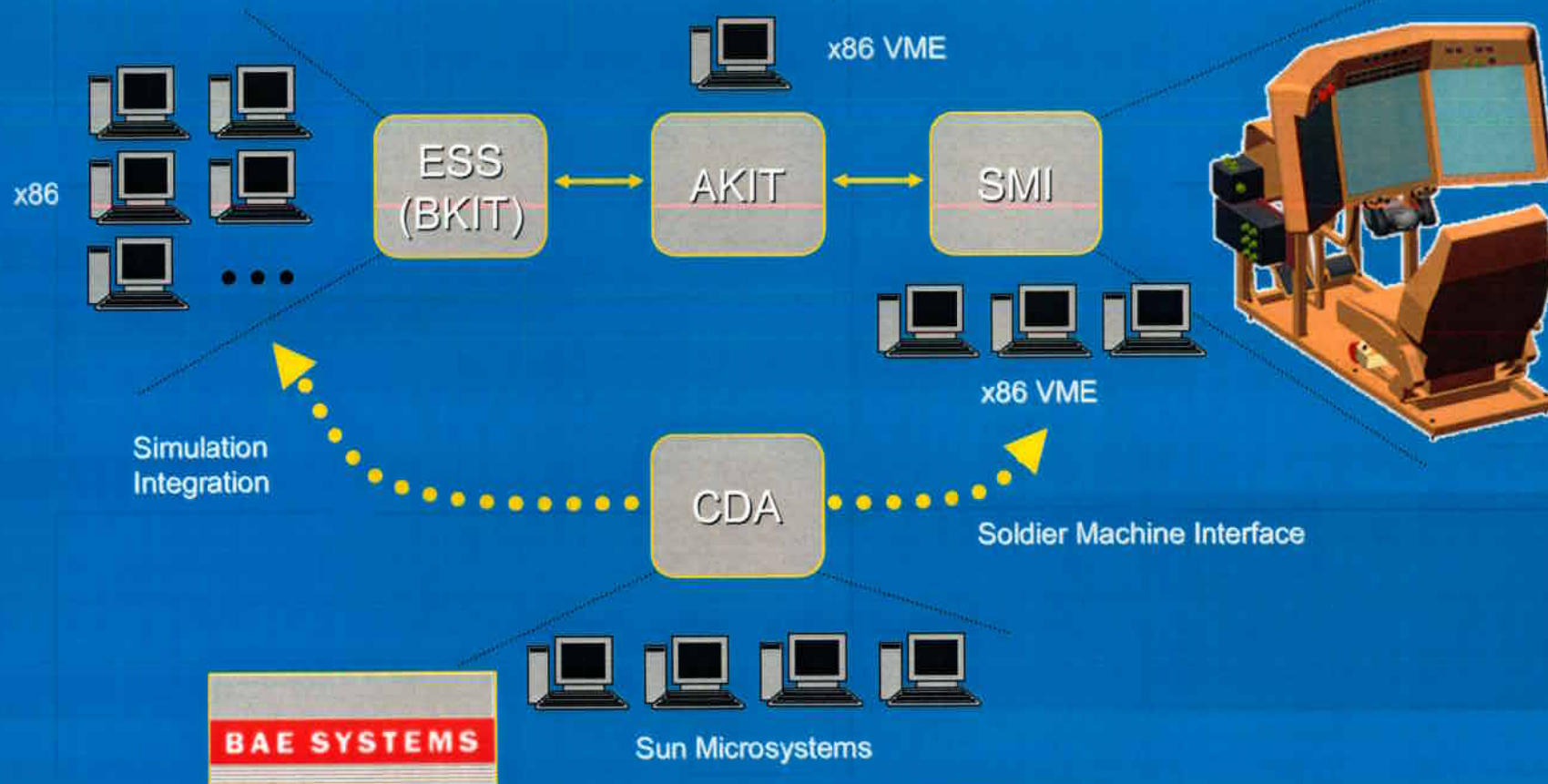


CDA Integration Effort

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TARDEC Crew Integration and Automation Testbed (CAT) Crew Station Embedded Simulation System (ESS) Architecture Overview





CDA Screen – Vehicle Protection Zones (U)

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Launch Smoke

CDA Mode

Disconnected

Setup Modes

Setup Zones

Diagnostics

Activate Zones

SNS/CM Status

Sensors

CM

Done

Activate All

Exclude All

CM State

Sensor State

Navigation Arrows



CDA Screen – Status and Diagnostics (U)

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Zone coordination capabilities for future formation / dismounted infantry experimentation

Status					
<u>EOW</u>	Proc	FAIL	<u>AP</u>	Proc	FAIL
	RR	FAIL		Tracker	FAIL
	RF	FAIL		Tracker Gimbal	FAIL
	LR	FAIL		Launcher	FAIL
	LF	FAIL		Launcher Gimbal	FAIL
<u>LWR</u>	Proc	FAIL	<u>DIRCM</u>	Proc	PASS
	RR	PASS		Laser	PASS
	RF	PASS		Gimbal	PASS
	LR	PASS	<u>LSAHCM</u>		PASS
	LF	PASS	<u>IFU</u>		PASS
<u>IRW</u>	Proc	PASS	<u>CDA</u>	Proc	PASS
	Sens	PASS		RAM	PASS
CM Modes		Active Exclusion Zone			
<u>AP</u>	DISABLE	NONE			
<u>DIRCM</u>	DISABLE				
<u>LSAHCM</u>	DISABLE				

DIAGNOSTICS		
SYSTEM	STATUS	LINK
CDA	FAIL	FAIL
IRW	FAIL	FAIL
EOW	FAIL	FAIL
LWR	FAIL	FAIL
DIRCM	FAIL	FAIL
AP	FAIL	FAIL
LSAHCM	FAIL	FAIL

Example: IRW connection detected and valid, status PASS

Example: If CDA cannot detect connection to simulated sensor models, Status/Link will be displayed in FAIL state



NAVAIR Integration Efforts

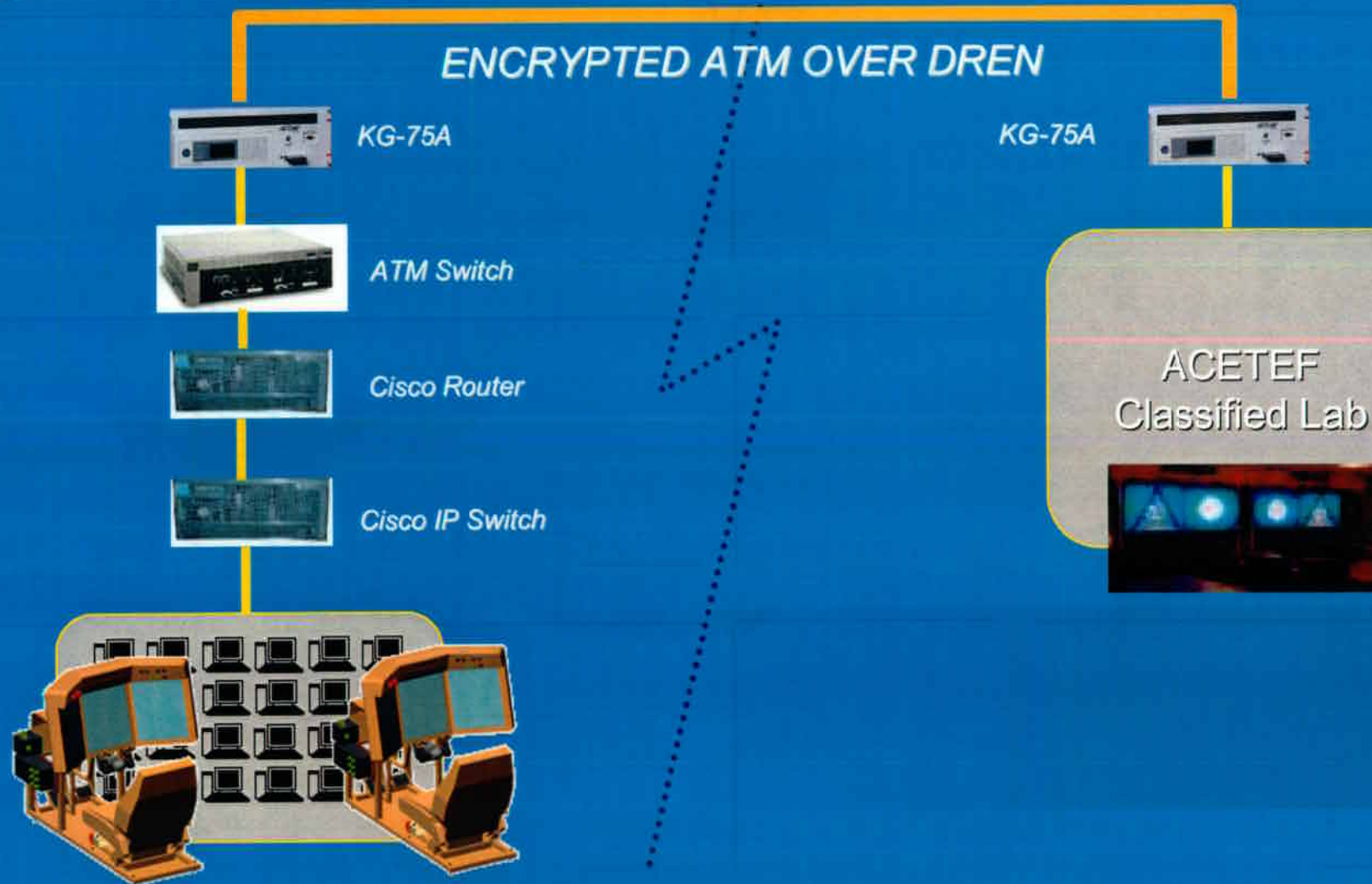
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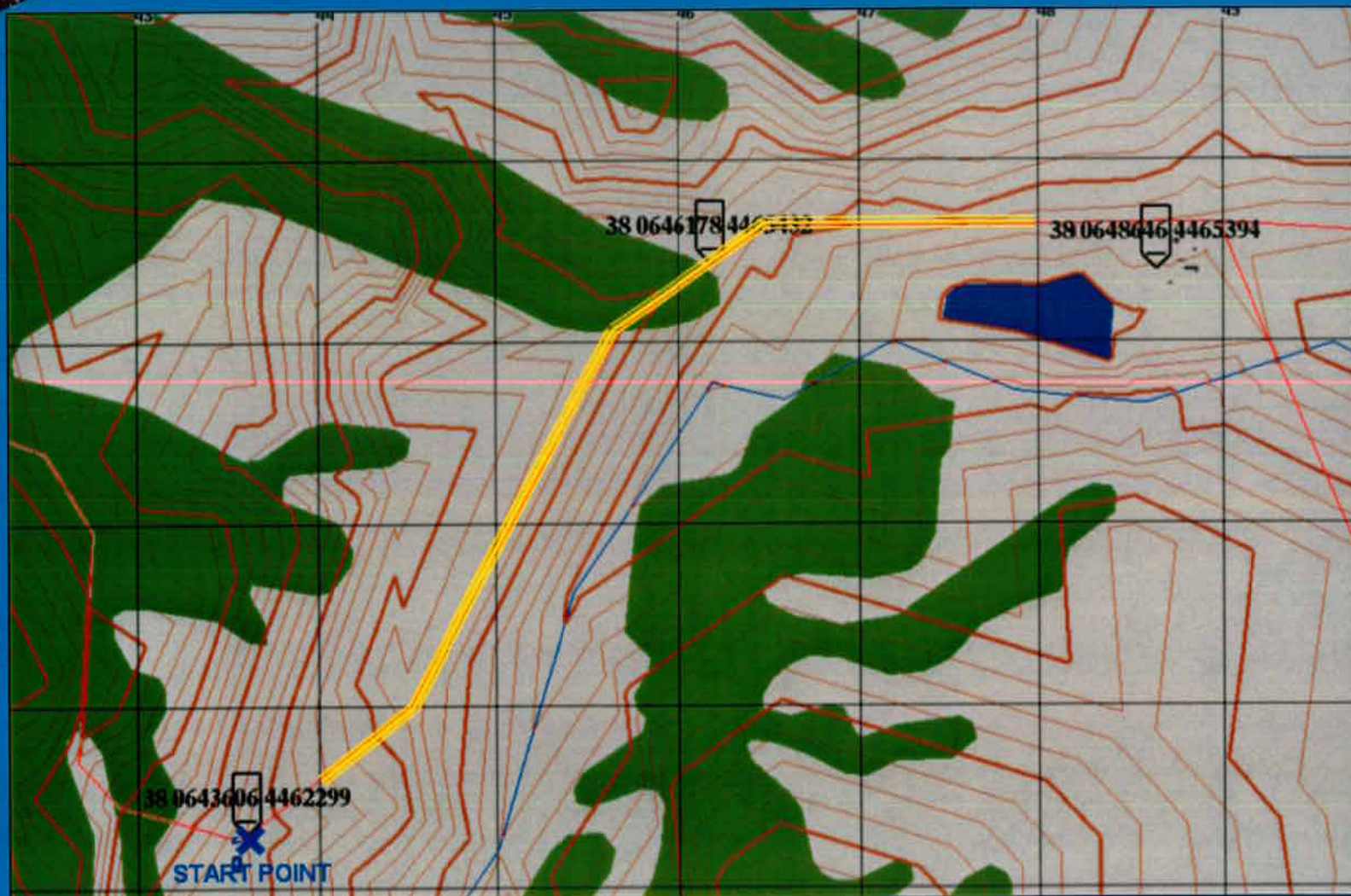
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Rural Scenario Overview

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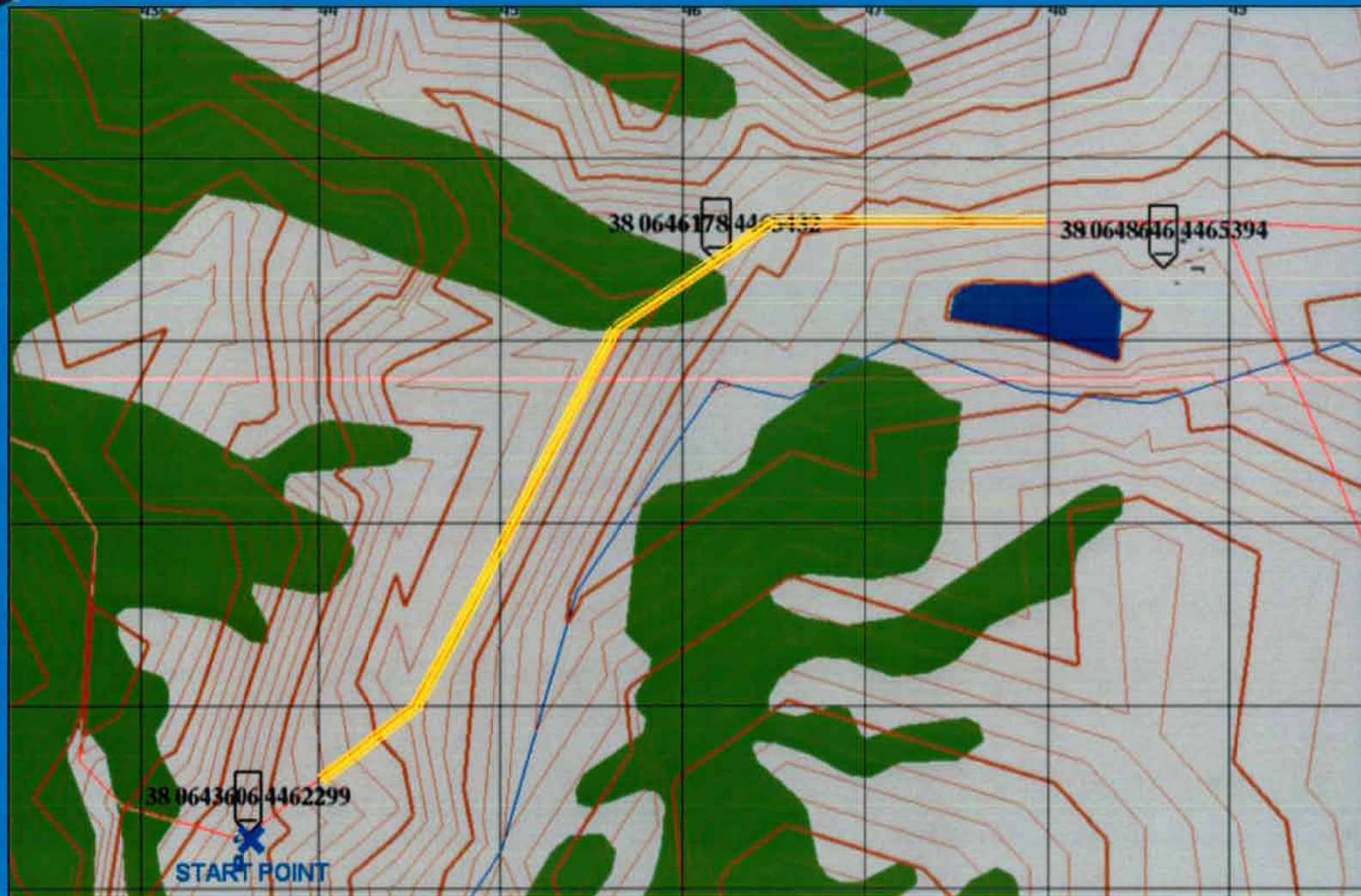




Rural Scenario Overview

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Rural Scenario OPFOR Assets

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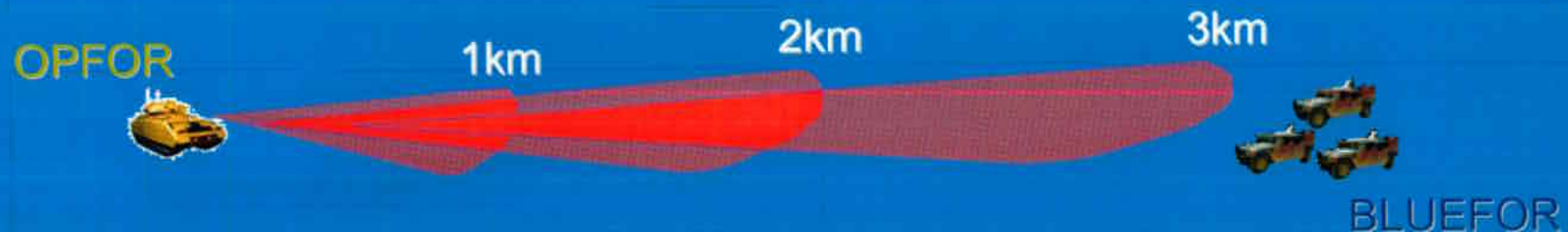


Experiment Results (on-going)

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- Signature Management Benefits
 - Increased survivability of vehicle per detection range reduction
 - Highest OPFOR defeat when detection range reduced from 3km to 2km
 - 2km to 1km range



- Other results
 - Simulation results logged for analysis
 - EMA performance
 - CDA performance
- Experiments on-going as of 04 Apr 05, further results TBD



Conclusions and Lessons Learned

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- Inter- and Intra- agency cooperation enhanced value of future technology experimentation
- Study of impact on scenario outcome with NAVAIR involvement
 - Increase in situational awareness with added intelligence
 - Increase in vehicle survivability
 - Increase in cooperation with Joint Service activity
- Programmatic
 - Experience in Stand-up of Classified experiment
 - Experience in Information Systems and Lab Physical Accreditation for desired classification levels
 - Experience in developing network infrastructure for classified communication



Questions?

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Thank You

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